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[Title of the Invention] E-MAIL SYSTEM

[Abstract]

[Object of the Invention]

To notify a mail user of an address input error early, and even if a mail address is uncertain, to surely transmit a mail to the desired address.

[Solving Means]

An input address is transmitted as a client request 4 to a mail server 7, to which a client belongs. The server 7 performs operation of receiving the request 4. A database management unit 9 of the server 7 performs retrieval from an address database 10 to check whether or not the mail address, received as the client request by a communication function unit 8, is included in mail addresses of mail users managed by the server 7 itself. If the mail address does not exist in the address database 10, the same retrieval is performed from a temporary address database 11 temporarily storing the mail addresses previously transmitted. In the case where the mail address can be retrieved by these two retrieval operations, a client-server response 5 is transmitted

to the mail client 1, and the mail user is notified of confirmation of existence of the mail address.

Pertinent Descriptions: [0009]-[0022]

[0009]

Fig. 1 is a block diagram showing one embodiment of the present invention.

[0010]

A mail user inputs an e-mail address of the destination by an input unit 3. The input address is transmitted as a client request 4 from a communication function unit 2 to a first mail server 7, to which a client 1 belongs. The first mail server 7 performs operation of receiving the client request 4 by a communication function unit 8.

[0011]

A database management unit 9 of the first mail server 7 performs retrieval from an address database 10 to check whether the mail address of the client request 4, received by the communication function unit 8, is included in mail addresses of mail users managed by the first mail server 7 itself. If the mail address does not exist in the address database 10, the database management unit 9 performs the same retrieval from a temporary address database 11 temporarily storing the previously transmitted mail addresses. In the case where the mail address can be retrieved by these two retrieval operations, a client-server response 5 is transmitted to the mail client 1, and the mail user is notified of confirmation of existence of the mail address.

[0012]

When retrieval of the transmitted mail address could not have been made by the above-mentioned retrieval operations, the database management unit 9 of the first mail server 7 refers to a server definition unit 6 defining information of other servers than the first mail server 7, which locate in remote locations, and transmits a server request 12 from a communication function unit 9 of the first mail server 7 to a server, to which an inquiry is to be made about information of the mail server designated by the mail address. A communication function unit 16 of a second mail server 15 receives the server request 12. A database management unit 17 of the second mail server 15 performs retrieval from an address database 18 storing information of mail addresses of mail users, who belong to the mail server specified by the server request 12, or from a temporary address database 19. When retrieval of the mail address, which belongs to the mail server, could have been made by this retrieval operation, the database management unit 17 of the second mail server 15 transmits a server-server response 13 to the first mail server 7.

[0013]

When retrieval of the transmitted mail address could not have been made even by this retrieval operation, the database management unit 17 of the second mail server 15 refers to a server definition unit 14 defining information of other servers than the second mail server 15, and transmits the server request 12 from a communication function unit 16 of the second mail server 15 to a server, to which an inquiry is to be made about information of the mail server. In the case where there is no information of the mail server to be referred at the time of referring to the server definition unit 14, a notification is transmitted to the mail server, from which

the server request 12 was transmitted, that there is no new mail user information to be transmitted. The communication function unit 8 of the first mail server 7 receives the server-server response 13, which is a response to the server request 12. In the case where the received server-server response 13 accompanies the mail user information, the database management unit 9 registers the mail user information in the temporary address database 11 storing the information of the mail address of the mail user, while the communication function unit 8 transmits the client-server response 5 informing that the client request 4 is valid. In the case where the received server-server response 13 does not accompany the mail user information, the communication function unit 8 transmits the client-server response 5 so as to inform that the client request 4 is invalid.

[0014]

The mail client 1 receives the client-server response 5 by the communication function unit 2, and informs the mail user whether the mail address is valid or not.

[0015]

Next, an operation of information management performed by the temporary address database 11 will be described.

[0016]

The communication function unit 8 of the first mail server 7 refers to the server definition unit 6 and the temporary address database 11. When time from the final updating date of the temporary address database 11 has lapsed over an update interval of the server definition unit 6, the server request 12 is automatically transmitted to that mail server. When the server-server response 13 is received in response to the server request 12, the database management unit 9 of the first mail server

7 updates the temporary address database 11, making the address of that server valid. Conversely, when the server-server response 13 is not received, the database management unit 9 of the first mail server 7 deletes the information of that mail server from the temporary address database 11.

[0017]

Fig. 2 shows contents of definition of the server definition unit of the present invention. The contents contains description of the mail server, to which an inquiry is to be made about the information of the mail address, and the update interval, at which an inquiry is to be made, for each mail server. Names of the mail servers are defined in the first column, names of the mail servers, to which inquiries are to be made, are defined in the second column, update intervals of the server information are defined in the third column, and update terms are defined in the fourth column.

[0018]

Fig. 3 is a diagram showing a structure of each of the address database and the temporary address database. The address database is structured in such a way that mail addresses, which belong to the mail server, and the final updating dates of the mail addresses are respectively recorded for the name of each mail server and the final updating date of the mail server.

[0019]

Fig. 4 shows a format of the client request 4 to be transmitted from the client to the server. The format describes the mail address input by the mail user, which is subjected to validity check, and a retrieval formula of the mail address input by the mail user. A line starting with "#" is a commentary line. The mail address, which is subjected to validity confirmation, is indicated between "START_REQ_ADDRESS" and "END_REQ_ADDRESS", and it is possible to

describe a plurality of such mail addresses. The mail address, which is subjected to the retrieval, is indicated between "START_REQ_SRCH_ADDRESS" and "END_REQ_SRCH_ADDRESS", and it is possible to describe a plurality of such mail addresses. The first column indicates a retrieval number, the second column indicates the retrieval formula of the mail address, and the third column indicates a retrieval formula of the mail server.

[0020]

Fig. 5 shows a format of the server request 12 to be transmitted from the server to the server. The format describes the request for the mail address information, which is updated after the designated updating date, and the request for the mail server information, which is updated after the designated updating date, for each designated mail server. A line starting with "#" is a commentary line. The mail server, which requires new additional information of the mail address, is indicated with the current final updating date between "START_REQ_NEW_ADDRESS" and "END_REQ_NEW_ADDRESS", and it is possible to indicate a plurality of such mail servers. The first column indicates request numbers, the second column indicates names of the requested mail servers, and the third column indicates updating dates. The request for the mail server information, which is updated after the designated updating date, is indicated between "START_REQ_NEW_SERVER" and "END_REQ_NEW_SERVER".

[0021]

Fig. 6 shows the client-server response 5 to be transmitted from the server to the client. A result of the check on the mail address requested by the client, which is subjected to check, and a result of the retrieval, performed with the retrieval formula requested by the client, are indicated. A line starting with "#"

is a commentary line. A validity confirmation result (INVALID or VALID) of the mail address is indicated for each mail address between "START_ANS_ADDRESS" and "START_ANS_ADDRESS". A result of the retrieval of the mail address is indicated for each retrieval number between "START_ANS_SRCH_ADDRESS" and "END_ANS_SRCH_ADDRESS".

[0022]

Fig. 7 shows a format of the server-server response 13 to be transmitted from the server to the server. The format describes a result of the retrieval of the mail address, which is added or updated in the mail server specified by the server request after the updating date, and the mail server information, which is added or updated after the specified updating date. A line starting with "#" is a commentary line. The new additional information of the mail address, corresponding to each request number, is indicated between the request number "START_ANS_NEWS_ADDRESSES" and the request number "END_ANS_NEWS_ADDRESS". Further, in the case where "NO_NEW_RECORD" is received, instead of the mail address, this means that there is no mail address added after the final updating date. A name of the mail server updated after the designated updating date is indicated between "START_ANS_NEW_SERVER" and "END_ANS_NEW_SERVER".